

5 The remainder of the Figure 3 elements are arranged and employed respectively
in a similar manner as shown in Figures 1 and 2.

WHAT I CLAIM IS:

- 10 1. Ceramic armor apparatus comprising in combination:

15 A ceramic facing element with thickness of 0.080-inches to
0.310-inches

 An adhesive layer with thickness ranging from 0.002-
inches to 0.090-inches

20 An aramid fiber composite substrate with thickness of
0.130-inches to 0.350-inches.

2. The apparatus of claim 1 in which the armor provides protection
against the 5.56mm M193 bullet, the 5.56mm M855 bullet, the 5.56mm SS109
25 bullet, the 7.62mm M80 bullet, the 7.62mm LPS bullet, the 7.62mm PS bullet
either alone or in any combination thereof.

3. The apparatus of claim 1 where the ceramic facing is comprised of
Boron Carbide ceramic.

- 30 4. The apparatus of claim 1 where the ceramic facing is comprised of
Silicon Carbide ceramic.
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5. The apparatus of claim 1 when the ceramic facing is comprised of a ceramic matrix composite that contain either of the ceramic materials of claims 4 and 5 either alone or in combination.

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6. The apparatus of claim 1 where the ceramic element is a continuous monolithic plate that is generally flat, or with single, double, or compound curvature.

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7. The apparatus of claim 1 where the adhesive layer is comprised of epoxy adhesive.

8. The apparatus of claim 1 where the adhesive layer is comprised of polysulfide adhesive.

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9. The apparatus of claim 1 where the adhesive is comprised of polyurethane adhesive.

10. The apparatus of claim 1 where the adhesive is comprised of polyolefin materials.

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11. The apparatus of claim 1 where the fiber composite substrate is comprised of aramid fibers with fineness ranging from 250- to 3,500-denier.

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12. The apparatus of claim 1 where the aramid composite is comprised of aramid fiber fabrics in plain, basket, or twill weave styles with basis weights between 3.5- and 20.0-ounces-per-square-yard.

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13. The apparatus of claim 1 where the aramid composite is comprised of aramid fiber unidirectional all tapes arranged in 0, 15, 30, 45, 60, 90-degree orientation or combinations thereof.

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14. The apparatus of claim 1 where the aramid fiber backing is comprised of 3-dimensional structure that incorporates stitching of fiber axes along or about the z-axis of the fabric.

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15. The apparatus of claim 1 through 15 where combined thickness of the ceramic, adhesive, and substrate elements falls in the range between 0.430-inches and 0.530-inches inclusively.

16. The apparatus of claim 1 in which the combined weights of the ceramic, adhesive, and substrate elements falls in the range between 4.00- and 5.70-pounds-per-square-foot inclusively.

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